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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/734,106	12/15/2003	Takamasa Usui	04329.3196	4860
7590 01/26/2005			EXAMINER	
Finnegan, Henderson, Farabow, Garrett & Dunner, L.L.P. 1300 I Street, N.W. Washington, DC 20005-3315			LOKE, STEVEN HO YIN	
			ART UNIT	PAPER NUMBER
			2811	

DATE MAILED: 01/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/734,106

Applicant(s)

USUI, TAKAMASA

Examiner

Steven Loke

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 6,7,9 and 13-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5,8 and 10 is/are rejected.
- 7) ☒ Claim(s) 11 and 12 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 12/15/03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

1. Applicant's election without traverse of Species 1 in the reply filed on 12/30/04 is acknowledged.
2. Claims 6, 7 and 13-20 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 12/30/04. Since claim 9 is depend to non-elected claim 7, claim 9 is also withdrawn from further consideration.
3. Figures 18-20 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.
4. Claim 11 is objected to because of the following informalities: lines 3-4, the phrase "the first insulating layer" has no antecedent basis. Appropriate correction is required.
5. Claims 3 and 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3, lines 4-5, the phrase "the minimum distance in design rules" is unclear as to what is the actual value of the minimum distance in design rules.

Claim 8, line 2, the phrase "the insulating film of low dielectric film" is unclear whether it is being referred to the insulating film of low dielectric constant.

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, 3, 4 and 10 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Umematsu et al.

In regards to claim 1, Umematsu et al. show all the elements of the claimed invention in figs. 3A and 3B. It is a semiconductor device, comprising: a semiconductor substrate [12]; at least one electrode pad [31] formed above the semiconductor substrate; a multilevel interconnection configuration [28, 30, 32] disposed between the electrode pad and the semiconductor substrate, the multilevel interconnection configuration including a number of interconnection layers [28, 30, 32]; a first insulating film [38a through 38i] of low dielectric constant which is formed above the semiconductor substrate to insulate the interconnection layers from one another; and a dummy interconnection configuration [28a, 30a, 32a] formed at least within the first insulating film around the periphery of the electrode pad.

In regards to claim 3, Umematsu et al. further disclose the distance between the dummy interconnection configuration and the multilevel interconnection configuration is set substantially equal to a distance.

In regards to claim 4, Umematsu et al. further disclose the dummy interconnection configuration comprises interconnection layers corresponding in number to the interconnection layers of the multilevel interconnection configuration and vias [32a] which interconnect the interconnection layers.

In regards to claim 10, Umematsu et al. further disclose the dummy interconnection configuration is formed at least within the range of thickness of the insulating film of low dielectric constant.

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 2 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Umematsu et al.

In regards to claim 2, Umematsu et al. differ from the claimed invention by not showing the dummy interconnection configuration is formed in a position corresponding to a displacement of a wire to be bonded to the electrode pad from the periphery of the electrode pad.

It would have been obvious for the dummy interconnection configuration is formed in a position corresponding to a displacement of a wire to be bonded to the electrode pad

from the periphery of the electrode pad because it depends to the size of the wire to be bonded to the electrode pad.

In regards to claim 5, Umematsu et al. differ from the claimed invention by not showing the dummy interconnection configuration is formed in the shape of a ring around the periphery of the electrode pad.

It would have been obvious for the dummy interconnection configuration is formed in the shape of a ring around the periphery of the electrode pad because it depends to the shape of the electrode pad.

10. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Umematsu et al. in view of Applicant's Prior art (figs. 18 and 19).

Umematsu et al. differ from the claimed invention by not showing the insulating film of low dielectric constant is 20 GPa or less in Young's modulus.

Applicant's Prior art (figs. 18 and 19) show the insulating film of low dielectric constant [15] (SiOC) is 20 GPa or less in Young's modulus.

Since both Umematsu et al. and Applicant's Prior art teach an interconnection structure formed in an insulating layer, it would have been obvious to have the low dielectric constant insulating film of Applicant's Prior art in Umematsu et al. because it decreases the capacitance between the wiring layers in the interconnection structure.

11. Claim 11 would be allowable if rewritten or amended to overcome the objection set forth in this Office action.

12. The following is a statement of reasons for the indication of allowable subject matter: The major difference in the claims not found in the prior art of record is the third

insulating film formed on the second insulating film and having a Young's modulus of 20 GPa or less.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven Loke whose telephone number is (571) 272-1657. The examiner can normally be reached on 7:50 am to 5:20 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (571) 272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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January 22, 2005

Steven Loke  
Primary Examiner  
*Steven Loke*